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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/537,855	11/08/2005	Andreas Kollmann	DE02 0306 US	7213

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SAN JOSE, CA 95131

EXAMINER
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GOODLEY, JAMES E

ART UNIT	PAPER NUMBER
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2817

NOTIFICATION DATE	DELIVERY MODE
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02/06/2008

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ip.department.us@nxp.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/537,855	<b>Applicant(s)</b> KOLLMANN, ANDREAS	
	<b>Examiner</b> JAMES E. GOODLEY	<b>Art Unit</b> 2817	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07 November 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11 and 13-21 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-9, 11, 13, 14 and 19 is/are rejected.
- 7) ☒ Claim(s) 6, 10, 15-18, 20 and 21 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments filed 11/7/2007 have been fully considered but they are not persuasive. Applicant argues that it would not be obvious to combine Wordelman with Ward to arrive at the claimed invention because Wordelman disclose a single-ended crystal oscillator and Ward discloses a differential oscillator.

However, as can be seen in Fig. 12 of Ward, there are two feedback paths for crystal oscillation, one through high pass filter 1232 and PMOS 1228 and another feedback path through high pass filter 1234 and PMOS 1226. Although Wordelman is implemented as single-ended with only one feedback path (through stages 12, 14 and 16), the mode suppression (bandpass or harmonic selection) concept disclosed could be extended to the differential setting by utilizing two bandpass filters in place of the two high pass filters utilized in Ward, to select the desired crystal oscillation harmonic. The benefit is direct differential clock signal production, helping to further cancel out signal noise, as well as eliminating the need for a single-ended to differential converter.

The title objection has been removed due to amendment.

The 112/2<sup>nd</sup> paragraph rejection has been removed due to claim amendment.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 7, 8, 11, 13 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Wordelman (US 6,169,460)** in view of **Ward et al. (US 6,696,898)**.

Regarding **claim 1-3, 11, 13 and 19**, line 8 of column 3 to line 31 of column 5 and Figs. 1-3 of Wordelman disclose an oscillator circuit for generating a high-frequency electromagnetic oscillation, comprising:

an amplifier [14] configuration with at least one input [14a] and at least one output [14b],

an oscillator crystal [18] connected to at least one of the outputs of the amplifier configuration,

a bandpass filter configuration [enable band filter trap 16], which is connected, with at least one input [12B], to the oscillator crystal (via amplifier 12) and the at least one output of the amplifier configuration connected to the oscillator crystal, and back coupled, with at least one output [14a], to the input, of the amplifier configuration, wherein, through dimensioning of the amplitude-frequency characteristic (see magnitude plot in Fig. 3) and the phase-frequency characteristic (see phase plot in Fig. 3) of the bandpass filter configuration as a function of the amplitude-frequency characteristic and the phase-frequency characteristic of the amplifier configuration and the oscillator crystal, the oscillation condition is fulfilled exclusively for a selected harmonic of the oscillator crystal (see lines 23-26 of column 3, lines 46-67 of column 4 and Fig. 3 for the suppression of unwanted harmonics outside of the desired mode  $f_0$ ),

and the high-frequency, electromagnetic oscillation formed by this selected harmonic of the oscillator crystal is available at the output of the bandpass filter configuration ( $R_{fout}$  is available via amp 14 and crystal 18, or alternatively one may take the oscillation output anywhere in the oscillation feedback loop).

Wordelman fails to disclose, “characterized in that the amplifier configuration is designed with, in each case, at least one pair of at least substantially symmetrical inputs and outputs (differential inputs and outputs) for processing electromagnetic oscillations (known as differential signals), operated at least substantially symmetrically relative to a first reference potential.”

However, as disclosed in Figs. 12 and 16 and paragraphs 95-104 and 122 in Ward, it is known to utilize a differential oscillator amplifier in a crystal oscillator circuit. Ward discloses symmetrical inputs [ $V_{o\_n}$  and  $V_{o\_p}$ ] to respective symmetrical differential outputs [ $V_{o\_p}$ ,  $V_{o\_n}$ ] of cross-coupled inverting amplifiers [1226, 1228], being coupled at their source terminals and the drains form the differential outputs. The drains are further coupled through NMOS load paths [1244, 1246] to a second reference potential [ $V_{ss}$ ]. The inputs and outputs are operated symmetrical relative to a first reference potential [ground, between  $V_{dd}$  and  $V_{ss}$ ]. Fig. 13 of Ward further provides for a differential to single-ended converter amplifier [1352] that produces an oscillation output that is unbalanced and therefore asymmetric relative to ground.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a differential amplifier, like that suggested by Ward, for the purpose of helping to cancel noise in the oscillation signal.

Regarding **claims 7 and 8**, the device of Wordelman in view of Ward discloses the circuit of claim 3, characterized in that the amplifier configuration comprises an offset compensation device comprising, in each case, a high-pass circuit [1232, 1234 – see paragraphs 99 and 100] between:

each of the differential inputs of the amplifier,  
the gate terminals of the NMOS transistors 1244 and 1246 are coupled with this differential input (via 1248 and 1250 and the high pass filters),  
the differential output former by the drain of said FET,  
wherein the limiting frequency is small as compared with the frequency operating range of the oscillator.

Each of the high-pass circuits contain a capacitor [1236, 1240] coupled with the gates of the FETS (via 1248, 1250) and each filter contains a resistor [1238, 1242], via which the gates of the FETS is coupled with the differential outputs of the amplifier (via 1248, 1250).

Claims 4, 5 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Wordelman (US 6,169,460)** in view of **Ward et al. (US 6,696,898)**, in further view of **Balan et al. (US 6,798,301)**.

Regarding **claims 4, 5 and 9**, the device of Wordelman in view of Ward discloses the circuit of claim 3, but does not disclose that, “the amplifier configuration is coupled with an auxiliary starting circuit, by means of which, during a predetermined period when the oscillator circuit is put into operation, a differential voltage is supplied to the

gate terminals of the field effect transistors, coupled at their source terminals, of the differential amplifier circuit comprising the amplifier configuration.” The device of Wordelman in view of Ward also does not disclose that, “the amplifier configuration comprises a control-voltage generation stage for generating a control voltage, which is supplied to gate terminals of the output load transistors.”

However, Figs. 3 and 4 of Balan discloses a crystal oscillator circuit with a start-up time amplitude control function. The peak detector [22, 52] compares the oscillator output with a reference potential [ $V_{\text{target}}$ ] and in response, sends a control voltage [20] to set a current from current source [48] to control a bias to oscillation amplifier [50]. There is also a constant current source [76, 78], which aids in peak detection. One of ordinary skill would recognize the implementation of such a peak detection function into the device of Wordelman in view of Ward, by applying a start-up control voltage to the biasing transistors [1244, 1246] in Ward.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a start-up time regulation circuit, such as disclosed by Balan, into the device of Wordelman in view of Ward, for the purpose of regulating output amplitude and start-up time.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Wordelman (US 6,169,460)** in view of **Ward et al. (US 6,696,898)**, in further view of **Burgoon (US 4,378,532)**.

Regarding **claim 14**, the device of Wordelman in view of Ward discloses the circuit of claim 13, but does not disclose that, “the bandpass filter configuration is designed with a cascade connection of at least two bandpass stages.”

However, line 45 of column 3 to line 38 of column 4 and Fig. 1 of Burgoon disclose a crystal oscillator with positive feedback through an inverting amplifier [10] and two bandpass filter stages [14, 16]. One of ordinary skill would recognize the possibility of multi-filter implementation such as disclosed in Burgoon, into the device of Wordelman in view of Ward.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a multi-filter arrangement, such as disclosed by Burgoon, into the device of Wordelman in view of Ward, for the purpose of more finely filtering out-of-band signals from the desired oscillation mode.

### ***Allowable Subject Matter***

Claims 6, 10, 15-18 and 20-21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the references of record do not disclose or fairly suggest the claimed structure of the operating point regulating stage, starting circuit, bandpass stages or converter circuit.



***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

***Contact Information***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAMES E. GOODLEY whose telephone number is (571)272-8598. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert J. Pascal can be reached on (571)272-1769. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Robert Pascal/

Supervisory Patent Examiner, Art Unit 2817

<b>Application Number</b> 	<b>Application/Control No.</b>	<b>Applicant(s)/Patent under Reexamination</b>	
	10/537,855	KOLLMANN, ANDREAS	
	<b>Examiner</b>	<b>Art Unit</b>	
	JAMES E. GOODLEY	2817	